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ABSTRACT

Adventure travel to Latin America requires careful planning, implementation, and followup to ensure safe, healthy experiences. This paper provides an overview of basic principles of prevention, assessment, and treatment of medical problems common to adventure travel in tropical areas. A brief introduction defines the vegetation and climatic challenges. A pretrip planning section discusses: (1) understanding the risks (disease, injury, limited medical care in developing countries); (2) medical research and resources on health care in tropical countries; (3) immunizations; (4) trip insurance; (5) trip logistical considerations; and (6) medical kits. A discussion of endemic tropical diseases and their treatments covers cholera, dengue fever, giardiasis, hepatitis A, hepatitis B, HIV, influenza, malaria, meningitis, rabies, tapeworms, travelers' diarrhea, typhoid fever, and yellow fever. A section on principles of safe foreign travel discusses food; water; insects; environmental emergencies (such as shellfish reactions, altitude sickness, diving injuries, dehydration); hygiene; posttrip followup; and the importance of skilled and experienced leadership. Appendixes include travel medicine terminology, an endemic diseases chart, water disinfection procedures, medical kit supplies, general principles of safe foreign travel, and sources on wilderness and travel medicine. (Contains 22 general references and other specific categorical references.) (SAS)

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Wilderness Medicine: Considerations of Adventure Travel in Tropical Areas of Latin America

By

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Adventure travel to Latin America can provide the opportunity for tremendous recreational and educational experiences. Trips require careful planning, implementation, and follow-up to ensure safe, healthy travel adventures. This article provides an overview of basic principles of the prevention, assessment, and treatment of medical problems common to adventure travel in tropical areas. It offers some simple and practical considerations for safe and healthy travel to the tropical regions of Latin America.

I. Introduction to the Geography of Latin America

The geographical area of Latin America includes all of the mainland of the Western Hemisphere south of the United States as well as surrounding islands such as parts of the Caribbean that share the Latin America culture and language. The tropics lie in the area between the Tropic of Cancer (22.5 degrees north of the Equator) and the Tropic of Capricorn (22.5 degrees south of the Equator).

There are several vegetation habitats in the Tropical Latin America including rain forest, cloud forest, dry tropical forest, deciduous forest, coniferous forest, alpine, scrub, desert, and savanna. The vegetation habitats are directly related to local geographical factors such as seasonal variation, rainfall, snowfall, cloud cover, slope aspect, elevation, soil type, and human impact.

This article will focus on travel considerations in the mid-lower elevation (<6000 feet/1850 meters) areas of Tropical Latin America. All of the above vegetation types, except alpine vegetation, will be encountered at the mid-lower elevations.

In the above defined regions, environmental challenges to homeostatis (normal human body function/equilibrium) are temperature, moisture (rain/humidity), and wind. Environmental challenges experienced by travelers in these regions will range from extremely wet to extremely dry precipitation conditions, cool to hot temperatures, and varying wind conditions. Some areas will have seasonal variation in temperatures, precipitation, and wind.

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II. Pre-trip Planning

A. Understanding the Risks of Travel

1. Disease

Disease is much more prevalent in developing countries than industrialized nations. Many diseases that are not a threat in industrialized nations exist in developing countries. Of the 50+ diseases that were examined as threats to travelers in Tropical Latin America, fewer than 10 are present among the general population in the U.S. Only a few such as Influenza, HIV, and Hepatitis B are considered serious threats to the public health.

Diseases such as Hepatitis A, while rare in the U.S., are prevalent in Latin America due to contamination of the water supply. Diseases such as Polio and Measles, prevented in the industrialized countries through routine immunization programs, are present in developing nations.

The lack of available health care professionals, facilities, medical supplies and medications; the lack of proper food storage; unsanitary handling and preparation of food; untreated water supplies; inadequate sewage treatment; lack of pollution controls; overcrowded living conditions; and malnutrition contribute to the prevalence of disease in Tropical Latin America.

2. Injury

In Tropical Latin America, most injuries to travelers occur in motor vehicle accidents. In general, the driving conditions are much safer in the industrialized nations than in developing countries. Poor road conditions, overcrowded roads, inadequate law enforcement of traffic regulations, unsafe vehicles, and fast drivers make automobile/bus travel hazardous. Buses are used more often in Latin American than in the United States, often on narrow, winding roads. The rate of motor vehicle accidents is much higher in Latin America than in the United States. (Forgey, Travelers' Medical Resource, pp. 3-1-3-3)

Another threat to personal safety comes from crime and terrorism. While many places in Latin America are extremely safe, such as Costa Rica, other areas such as Colombia and Peru, can be hazardous.

In parts of Mexico, there have been reports of bandits, who have robbed and killed travelers on the highways. Colombia is well known for its violence, primarily involving terrorism and drug trafficking. For many years Peru has been terrorized by the violent acts of the Sendero Luminoso (Shining Path), a

Maoist terrorist group that is now involved also in drug trafficking. Theft of belongings, particularly in public places such as bus stations and markets, is a significant problem facing travelers in Latin America.

The U.S. Department of State makes advisories available concerning travel to foreign countries. While the State Department undoubtedly takes a conservative position in regard to the safety of U.S. citizens traveling abroad, it is wise to take the travel warnings very seriously. Any areas subject to warnings should be thoroughly researched prior to travel. Foreigners, particularly U.S. citizens, are sometimes targeted by terrorist groups due to the opportunities for publicity.

Whether a traveler is subject to criminal or terrorist actions, a disoriented foreigner is an easy target. Travelers must always maintain a level of awareness of their surroundings to avoid trouble situations.

3. Medical Care in Developing Countries

Medical care in developing countries is often not up to the standards of care to which a traveler is accustomed. Medical personnel, supplies, technology, facilities, and medicines are often unavailable in developing areas.

A particular problem occurs in the sanitation and hygiene of health care. A major cause of concern is the multiple use of needles and syringes. Another problem is the prevalence of contaminated blood supplies. Blood screening procedures are inadequate, and in some developing countries there is a high risk of blood being contaminated with HIV. (Forgey, Travelers' Medical Resource, p. 4-32)

In extremely remote areas, the best medical care may be available from trip/expedition personnel. Extended trips to remote areas need to be staffed with personnel who are knowledgeable and skilled in wilderness and travel medicine.

B. Medical Research

An important aspect for safe and healthy international travel is the research of the health risks of travel to specific areas. There is more information available regarding travel medicine than most travelers can use. The biggest challenge is identifying the most useful sources of information. The extent of medical research necessary depends on several issues including the length of trip, number of different countries to be visited, degree of contact with local populations, the reliability of local medical care and trip/expedition care, and the incidents of disease.

1. Centers for Disease Control

The Centers for Disease Control (CDC), a U.S. governmental agency, is the foremost organizational authority concerning the risk of disease in international travel. The CDC maintains a concise, updated information center that advises travelers in regard to disease occurrence and risks, recommended vaccines, required vaccines, and general health guidelines. The CDC information center is accessed via automated operator using a touch tone telephone. Travelers can order (at no charge) faxes of the information, which are sent immediately upon request.

2. Herchmer Individual Country Database

The Herchmer Individual Country Database is a source of information which is updated frequently. It is compiled using information obtained from the CDC, World Health Organization, International Association of Medical Assistance for Travelers, U.S. State Department, Mortality and Morbidity Weekly Report (published be the U.S. Public Heath Service). (Forgey, Travelers' Medical Resource, pp. 2-57-2-58)

The database covered the topics of vaccinations, malaria risk, other special risk diseases, food/water/dairy products safety, U.S. and Canadian Embassy information, and U.S. Department of State Travel Advisories. (Forgey, Travelers' Medical Resource, pp. 2-57-2-58)

3. Books/Publications

There are numerous books and publications that cover wilderness and travel medicine. Recommended books include A Comprehensive Guide to Wilderness & Travel Medicine by Eric Weiss, MD and the Travelers' Medical Resource: A guide to health & safety worldwide by William Forgey, MD. The former is inexpensive and a good overview of the topics while the latter is a comprehensive, user-friendly guide that is highly recommended. Wilderness Medicine: Management of Wilderness and Environmental Emergencies, edited by Paul Auerbach, MD is the most comprehensive text available. However, it is of limited use to most travelers due to highly technical format. It is also very expensive. The Wilderness Medicine Newsletter is a bimonthly publication which often has articles regarding travel medicine. See the list of sources of information in the appendix for additional information.

Using the books and publications will help to explain the history, risks, pathology (causes/effects), and prophylaxis (preventive measures) of diseases. It is certainly appropriate to supplement the

recommendations from the CDC with additional information obtained in books and periodicals.

4. Organizations

There are several organizations which disseminate information as professional, educational or public service organizations. The World Health Organization (WHO) is a multinational organization that promotes health and monitors and reports on the condition of health worldwide. The WHO provides a good overview of worldwide health, however; the organization is involved in world politics which may affect the objectivity of its information. (Forgey, Travelers' Medical Resource, p. 2-14)

The International Association for Medical Assistance to Travelers exists to provide travelers access to English- or French-speaking physicians, educated in North America or Europe, who also meet the organization's quality of care standards. The organization also provides international travel recommendations. (Forgey, Travelers' Medical Resource, pp. 2-53-2-55)

The Wilderness Medical Society is a professional and educational organization made up of physicians, nurses, wilderness emergency medical technicians, wilderness first responders, outdoor instructors and guides, and others who are interested in wilderness and travel medicine. This organization publishes the Wilderness Medicine Letter and the journal Wilderness & Environmental Medicine.

Other organizations specializing in travel medicine include the American Society of Tropical Medicine and Hygiene and the International Society of Travel Medicine. See the list of sources of information in the appendix additional information.

5. Physician Consultation

A physician should be consulted prior to international travel. Travelers need to consult a physician who is knowledgeable in wilderness and travel medicine. Prior to consultation, travelers should do their medical research and be able to discuss the topics with the physician. The consultation will help to further define the need for immunizations, medications, etc. Vaccines and prescription drugs will have to be prescribed by the consulting physician.

C. Immunizations

Travelers should be current on all routine vaccinations, including tetanus. They should receive a Polio booster once as an adult. Either the Hepatitis A vaccine or Immune Globulin and the Hepatitis B

vaccine should be taken by travelers. Other vaccines that are often recommended include Typhoid, Influenza, and Yellow Fever. There are numerous other vaccines, such as Rabies and Meningococcus Meningitis, that may be appropriate for some travelers.

The traveler can choose to receive recommended vaccines. Required vaccines are those which a traveler must show proof of immunization (International Immunization Certificate) in order to enter a country. While required vaccines may be available for administration by immigration personnel, travelers should avoid getting vaccinated in foreign countries due to the reuse of needles and use of other non-sterile techniques. (Forgey, Travelers' Medical Resource, pp. 5-31-5-34, 5-46)

Immunizations provide either active or passive immunity. Active immunity is obtained from vaccines that stimulate the production of antibodies that are prepared to fight an antigen (infectious microorganism). Passive immunity is obtained from the injection of antibodies, developed in sterile human serum, directly into the body. (Forgey, Travelers' Medical Resource, p. 9-4)

Immunizations do not guarantee immunity to a disease. Compromise of the immune system can lead to infections despite the vaccination. Some vaccines are less effective than others. Therefore, prophylaxis always includes appropriate precautions in addition to immunizations.

D. Trip Insurance

The purchase of special insurance should be a consideration of all foreign travelers. Trip cancellation insurance covers the nonrefundable costs paid by travelers who cancel their plans.

Some medical insurance plans will not cover clients traveling in foreign countries necessitating the purchase of additional medical insurance. Proof of the financial resources to pay for medical care is of utmost importance in obtaining care. Unlike the U.S., medical care may not be rendered until a patient can prove that they can pay.

Evacuation insurance is a consideration, especially for travelers to remote areas who are involved in high risk activities. This may include both in-country evacuation and emergency medical flights to the home country and facility of choice.

Auto insurance may not cover drivers while they are driving in foreign countries. Some countries, such as Mexico, require the purchase of liability insurance from a domestic (Mexican) source.

E. Trip Plan/Logistical Considerations

Safe travel requires adequate planning in regard to food, water, lodging/camping, climate,

seasonal variation, altitude, travel within the country, clothing, requirements concerning immigration and customs, and an emergency/evacuation plan.

F. Medical Kits

Medical kits should be assembled that are appropriate given the parameters of the trip including the level of medical training. There is no perfect medical kit. Kits should be tailored according to the area of travel, length of trip, remoteness, and type of activity. See the appendix for a general travel medical kit contents list.

Due to the greater likelihood of illness on foreign trips, more over-the-counter (OTC) and prescription drugs are generally carried. The primary medical staff need to be knowledgeable in the use of any drugs that are part of their medical kits.

It is better to obtain the drugs in the U.S. due to greater quality control. Travelers should be aware that some drugs can cause significant hassles in customs, even if carried with a valid prescription. Drugs with abuse potential such as Morphine and Valium can create problems in customs officials.

III. Endemic Tropical Diseases

Several of the more common endemic diseases of Tropical Latin America are discussed below with a focus on the pathology, assessment, field care, and prophylaxis. With the possible exception of Influenza (without complications) and mild Travelers' Diarrhea, all of these diseases require evacuation to definitive medical care personnel and facilities.

Organisms which cause disease are viruses, bacteria, protozoa, mycoses (yeast and fungi), and helminths (worms). Medications are available to treat bacterial, protozoan, mycosis, and helminthic infections. Only the symptoms of viruses can be treated. The viral organisms themselves must be overcome by the immune system. (Hubbell, "Why You Don't Want To Be Part Of The Food Chain or Proper Care & Feeding of Parasites," pp. 1-3)

A. Cholera

Cholera is a bacterial illness that causes massive diarrhea. The disease is very contagious and is spread through infected water and food which has been contaminated by the feces of infected people. It causes many deaths worldwide due to dehydration and loss of electrolytes. The field treatment is oral electrolyte replacement solutions (ORS).

The World Heath Organization has made great inroads in the prevention of deaths through its mass distribution of an ORS (Oralyte) throughout infected areas. The WHO ORS is excellent, but hard to purchase in the U.S. Oralyte is more available in developing countries. Gatoraid diluted to one-half strength provides for electrolyte replacement. An excellent ORS can be made by mixing one liter of fruit (orange, apple, etc.,) juice that contains potassium, one tablespoon of sugar or honey, and one teaspoon of salt. A second liter of water should be mixed with one teaspoon of baking soda. The fluid solutions should be sipped alternately. (Hubbell and Tilton, p. 178)

Given the appropriate resources, intravenous therapy should be used as it is much more effective than ORS.

Cholera can be avoided by taking appropriate food and water precautions. A vaccine is available; however, it is only about 50% effective. It also causes significant side effects in many people. (Forgey, Travelers' Medical Resource, p. 6-5)

B. Dengue Fever

Dengue fever is a viral illness resulting in a hemorrhagic fever that includes chills and significant aches and pains as well as a rash that starts in the arms and legs and spreads to the trunk. Spread by mosquito bites, this illness is rarely fatal.

Treatment consists of rest, hydration, and the use of pain and fever medication. The prevention of Dengue Fever includes appropriate use of insect precautions.

C. Giardiasis

This illness is a worldwide problem and is caused by protozoa living in water contaminated by feces of infected humans and other mammals.

The illness causes persistent watery diarrhea, abdominal cramps, nausea, bloating, and weight loss. Treatment includes medications (Flagyl), rest, and hydration. The prevention of this illness includes using proper water precautions.

D. Hepatitis A

Hepatitis A is a highly contagious viral illness that primarily affects the liver. It spreads through food and water that is contaminated by fecal matter of infected people.

This illness is rarely fatal; however, the infected person will likely be sick for 4-6 weeks with

nausea, fever, lethargy, joint pain, itching, and jaundice (yellowing of the whites of the eyes and skin). The treatment involves rest and fluids.

A vaccine is available, providing active immunity, and it is highly recommended to all travelers to Latin America. A booster is required six months after the initial injection and every 10 years. Immune Globulin, providing passive immunity, is also available. IG is reliable for approximately 3 months. Proper food and water precautions should be taken.

E. Hepatitis B

Hepatitis B is a bloodborne viral illness that primarily affects the liver. It is transmitted through blood and other body fluids is often spread through non-sterile medical and dental procedures, tattooing, body piercing, acupuncture, IV drug use, and unprotected sex. The disease is highly contagious and has been discovered to live in dried blood for approximately one week. The illness is sometimes fatal. The signs and symptoms are similar to Hepatitis A. This disease is a public health concern in the U.S. and other industrialized nations and it is epidemic in some developing countries.

The treatment of Hepatitis B includes rest and fluids. Preventive measures include using appropriate Personal Protective Equipment (PPE...latex gloves, eye protection, protective clothing, etc.) and sterile techniques and equipment during first aid and medical procedures. Persons should approach body piercing and tattooing with extreme caution and take careful measures regarding sexual activity, including the use of condoms and good judgment.

There is a vaccine that consisting of three injections over a six month period which, in most people, results in immunity for life. A test can determine whether someone needs an additional booster to increase immunity.

This vaccine is retroactive. A person who may have been exposed can start the series immediately following the incident. Although relatively new, this vaccine will likely become a routine immunization. All travelers should have the vaccination.

It should be noted that new forms of the virus have been discovered: Hepatitis C (bloodborne), D (food/waterborne), and E (food/waterborne).

F. HIV

HIV (Human Immunodeficiency Virus) is undoubtedly the most publicized worldwide disease

Relatively new, HIV is contagious, and because it mutates frequently, it is harder to understand and track. There is no cure and it is always fatal.

Some HIV positive patients live for several years without knowing they are infected. Others, who do know, lead functional lives for years before they develop AIDS (Acquired Immune Deficiency Syndrome). Because of the suppression of the immune systems, AIDS patients die of complications from infections that the normally functioning immune system would likely overcome. HIV and AIDS are treated aggressively with drugs that seem to delay the onset of the disease.

HIV is a bloodborne pathogen and is spread in the same manner as Hepatitis B. HIV is less contagious than Hepatitis B. For the most part, HIV dies within a few minutes outside of the body. The same prophylactic measure used to prevent the transmission of Hepatitis B should be used. There is no immunization against HIV.

Patients who are HIV positive, especially if they have developed AIDS, should be extremely cautious in regard to foreign travel due to their compromised immune system and the greater likelihood of exposure to infectious agents. Immunizations should be thoroughly researched before being taken by HIV positive patients. (Forgey, Travelers' Medical Resource, pp. 4-31-4-34)

G. Influenza

Influenza (Flu) is a viral disease that annually affects people worldwide. It is spread primarily through direct and indirect contact. It is also airborne, being spread through droplets from nasal secretions. Influenza is prevalent north of the Tropic of Cancer and south of the Tropic of Capricorn during the winter seasons due to the drier air, and the close proximity of people indoors. In the tropical zones, influenza is prevalent year round.

Influenza symptoms can be severe and usually range from 1-2 weeks. They include nausea, vomiting, diarrhea, respiratory tract infections, coughing, headache, and body aches and pains. The treatment of Influenza is rest and fluids, supplemented by pain and fever medications. Influenza can lead to complications, such as Pneumonia, and should be monitored closely. Extreme cases should be evacuated to definitive medical care.

Influenza strains are monitored closely as they change year to year. Vaccines, which last for one year, are available and are highly recommended for the elderly, health care professionals, and travelers to areas of epidemic Influenza.

H. Malaria

Malaria, a prevalent tropical disease, is caused by a protozoa and is spread by mosquito bites. It is endemic in almost all lowland tropical areas, especially remote and rural areas, with the exception of arid regions. According to Dr. William Forgey, "Malaria is the most important infectious disease in the world (over 100 million cases, with just under 1 million deaths yearly world-wide) and the most important health risk to Americans traveling to malaria infected areas." (Forgey, Travelers' Medical Resource, pp. 6-31-6-32)

Malaria causes fever, chills, and malaise. The disease may develop into severe headaches, seizures, and coma as a result of cerebral infection. Malaria is sometimes fatal and requires extensive definitive medical treatment.

By taking proper insect precautions and through the use of chemoprophylaxis, malaria can be prevented. In Latin America, there are two general drugs which are used: Chloroquine (Aralen) and Mefloquine (Larium). The former medication is used in Chloroquine-sensitive areas which include (as of 1992) the Caribbean, Mexico, Belize, Guatemala, Nicaragua, El Salvador, and Costa Rica, and Paraguay. The latter medication is used in Chloroquine-resistant areas which include (as of 1992) Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana, Peru, Bolivia, and Brazil.

I. Meningitis (Bacterial & Viral)

Bacterial (Meningococcal) and Viral Meningitis are present in the industrialized nations; however, they are prevalent in some regions of Latin America. Both forms of the disease cause flu-like symptoms accompanied by a stiff neck, severe headache, neck, and back pain. Meningitis is an infection of the meninges of the brain as well as the spinal cord. It is often fatal.

Bacterial Meningitis is highly contagious and is spread through airborne droplets and direct and indirect contact. In its early stages, it is treatable with antibiotics. There is a vaccine available which is recommended for travelers going to infected areas.

Viral meningitis is less contagious; however, it cannot be treated with antibiotics. Meningitis is occasionally by fungi.

J. Rabies

Rabies is a viral disease that is found among wild and domesticated animals throughout

developing countries. The disease is controlled in the U.S. through animal immunization laws and programs.

Rabies is spread through the blood, saliva, and feces of infected mammals. It causes an infection of the brain. Once the signs and symptoms appear it is almost always fatal.

Rabies is preventable. Animals (wild or domestic) should never be approached, handled, or petted during foreign travel. Cleaning (preparing carcasses) of dead animals should always be done using personal protective equipment.

Any bite or scratch from an animal should be considered suspect, especially if the animal exhibited strange or unusual behavior. Any suspected exposure to rabies should be followed immediately with the vaccine which can work retroactively.

K. Tapeworms

Tapeworms are helminthic infections that are transmitted through undercooked meat and fish. The worms infect the intestinal tract and move into other tissues such the skeletal muscles and brain. Infections may go unnoticed. Symptoms may include gastrointestinal pain, diarrhea, and weight loss. Tapeworm infections are treated with medications.

The prevention of tapeworm infections includes making certain that all meats and fish are thoroughly cooked.

L. Travelers' Diarrhea

Travelers' Diarrhea is the most common ailment affecting travelers to foreign countries. The infections are usually caused by bacteria; however, they can be caused by viruses and protozoa. Often, simply the change of bacteria types found in water can cause this illness.

Travelers' Diarrhea is estimated to affect as many as 50% of travelers to developing countries. There are three risk levels that correspond to geographical regions. Low risk countries include the U.S., Northern and Western Europe, Japan, Australia, New Zealand, and parts of the Caribbean Islands. Intermediate risk areas include Southern Europe, Eastern Europe, and parts of the Caribbean Islands. High risk areas include most of Latin America, Africa, Asia, and the Middle East. All countries in tropical regions should be considered high risk. (Forgey, Travelers' Medical Resource, p. 5-13)

The risk of Travelers' Diarrhea can be reduced significantly by the use of proper food and water precautions and through the prophylactic use of Bismuth Subsalicylate (Pepto Bismol). Two Pepto

Bismol tablets taken before each meal and before bed (8 maximum/day) have been shown to significantly reduce the onset of Travelers' Diarrhea.

A study by the University of Texas-Houston Medical School showed that the incidence of this illness was reduced from 61% to 23% among America students in Guadalajara, Mexico through the prophylactic use of Pepto Bismol. This method does produce some side effects such as dark stools, ringing in the ears, and a black-stained tongue. Medications containing aspirin should not be taken when using this prophylactic measure. People taking Coumadin should not use this method. Pregnant travelers should use this method only under the supervision of a physician. (Forgey, Travelers' Medical Resource, p. 5-14)

Another method of prophylaxis is the use of Doxycycline (antibiotic) which has been shown to significantly reduce the incidence of the illness. The contraindications include later stages of pregnancy, children under 8 years, and allergies to Tetracycline. There are side effects such as photosensitivity. The overuse of antibiotics will enhance the development of resistant strains of bacteria. Other antibiotics such as Bactrim DS or Septra DS and Idodchlordroxquin (Clioquinol) can also be used. In general, however, the use of prophylactic antibiotics is not recommended. (Forgey, Travelers' Medical Resource, pp.5-14-5-15)

Travelers' Diarrhea causes excessive, typically watery diarrhea as well as cramping. Sometimes nausea, vomiting and fever occur. A diagnosis of diarrhea is defined as loose stools that are double or triple the normal number of bowel movements per day.

Dehydration and electrolyte depletion are the biggest problems of this illness. The treatment of Travelers' Diarrhea includes attempting to determine the cause and stop ingesting it. Rest and oral electrolyte replacements are indicated. Pepto Bismol may decrease the amount of diarrhea.

Some physicians recommend an antibiotic (Doxycycline) for diarrhea that lasts for more than three or four days or when there is blood in the stool (blood indicates Amoebic or Bacillary Dysentery).

Anti-motility drugs such as Immodium are usually effective in stopping the diarrhea; however, they are generally not recommended. These drugs block the body's attempt to eliminate the infection which can allow opportunistic microorganisms to move from the intestinal tract into other tissues and body systems. The lack of bowel movements can also lead to the build-up of toxins in the gastrointestinal tract. These drugs should be reserved for limited, short-term use when toilet facilities will be unavailable, such

as long bus rides.

Travelers' Diarrhea is more common in younger adults than older adults and in persons that have reduced stomach acids levels. Taking antacids increases the risk as does using marijuana because it reduces stomach acids. (Forgey, Travelers' Medical Resource, p. 5-18)

Most cases are self-limiting and will be resolved by rest, fluids, and electrolytes. Extreme cases may need definitive medical care.

M. Typhoid Fever

Typhoid fever, a bacterial disease, is transmitted through food and water contaminated by the urine and feces of infected people.

Signs and symptoms of this disease include headache, fever, chills, loss of appetite, constipation, pain the back and abdomen, and nosebleeds. Reddish splotches may occur in some patients after about a week of symptoms. Rest, fluid replacement, and antibiotic therapy is the treatment.

Typhoid fever can be prevented through the use of proper food and water precautions. There is a vaccine that is recommended for travel to infected areas that is approximately 50% effective. It is available as two injections or as an oral vaccine. The vaccine is effective for approximately three years. (Auerbach, pp. 1115, 1145)

N. Yellow Fever

Yellow fever is a viral infection that is transmitted through mosquito bites. The disease may produce fever, vomiting of black blood, jaundice, "foamy" urine, delirium, seizures, and coma. Approximately 10 % of cases are fatal.

There are no effective treatments for this disease beyond rest, fluids, and fever control (using Acetaminophen/Tylenol).

This disease can be prevented through the use of insect precautions. There is a vaccine that is approximately 95% effective that is recommended for travel to infected areas. There are some contraindications including pregnancy, infants < 9 months, and persons with compromised immune systems. (Auerbach, p. 1136 and Forgey, Travelers' Medical Resource, pp. 6-70-6-74)

Some countries with endemic Yellow Fever require proof of vaccination for travelers coming from a country with endemic and/or epidemic Yellow Fever.

IV. Trip...Principles of Safe Foreign Travel

A. Food

When traveling to Latin America, it is appropriate to use caution regarding food. Numerous diseases such as Travelers' Diarrhea, Hepatitis A, Cholera, and Typhoid Fever are spread through contaminated food. The contamination comes from organisms present in the food, from contaminated hands preparing or handling food, contaminated water used in the food or to wash food, and spoiled food due to inadequate refrigeration of food products.

Food precautions include eating thoroughly cooked, fresh food that is served hot. Hot drinks are usually safe. Fruits that are peeled with clean hands and processed foods are usually safe.

Avoid salads, fruit that cannot be peeled, cooked food that is rewarmed or cold, food that requires refrigeration, unpasteurized dairy products, raw or undercooked meat or fish, and food from street vendors. Street vendors have been known to "freshen" fruits and vegetables with contaminated roadside water. "Cook it, boil it, peel it, or forget it."

It is important to use good hygiene during group food preparation. Utensils, bowls, cups, and water bottles should not be shared. Half-eaten food should not be shared. Sick people should not handle or prepare food.

Unfortunately, even cautious eaters will sometimes get sick from the food. One never knows for certain whether food is safe. Taking proper precautions to prevent disease helps to avoid problems.

B. Water

Water is a common vector for disease transmission. Often, simply the change in bacteria causes Travelers' Diarrhea. Other, more devastating diseases such as Hepatitis A, Cholera, and Typhoid Fever are transmitted by infected water. One should always avoid tap water except in urban areas where the water is treated. Often, tourist areas are so sensitive to this problem, that the treated tap water smells of chlorine, indicating proof of treatment.

Bottled water, soft drinks, and beer as well as hot drinks are usually safe. All ice in drinks, including alcohol drinks should be avoided.

Whenever water must be gathered, it should be treated by halogenation, boiling, or use of a water filter/purifier. Halogenation involves killing the microorganisms by poisoning with tincture of iodine, povidone iodine, chlorine bleach, halazone tablets, or water treatment tablets (Potable Aqua).

Water brought to a rolling boil at any altitude will kill harmful microorganisms. It is unnecessary to boil water for a certain amount of time. Bringing water to a rolling boil is sufficient.

Water filters and/or purifiers can be used, but it is important to understand the limitations of the equipment. Not all equipment is made the same. Some filters do not contain a purifying mechanism. See the appendix for additional information.

C. Insects

Insects can be a major problem in tropical areas of Latin America in terms of comfort and health. Mosquitoes are vectors for several diseases including Malaria , Yellow Fever, Encephalitis, and Dengue Fever. Fleas are vectors of the Plague. Sandflies cause Leishmaniasis.

There are numerous biting and stinging insects that cause painful normal and local reactions as well as anaphylaxis in hypersensitive individuals.

Anaphylaxis is defined as an acute systemic allergic reaction that results in respiratory distress and cardiovascular system collapse. Anaphylactic shock is fatal if not treated with the injectable drug Epinephrine, followed by antihistamine therapy.

Bites and stings are small puncture wounds that can result in infection. All bites and stings must be cleaned well with potable water.

The first step in avoiding insect bites and stings is to avoid their habitats. Mosquitoes live in moist, wet areas, in the lowlands, and around bodies of water. Clothing is the second level of defense. All exposed areas of skin are vulnerable. Openings in clothing such as pant cuffs need to be closed. Socks and shoes should always be worn. In some cases, it may be necessary to wear specialized mosquito-proof clothing and hat/hood.

The third method of defense is to use insect repellent and insecticide. Despite the unpleasant thought of using poisons on one's skin, it is the only proven method of repellent. Organic and other less toxic substances do not work. To repel mosquitoes, DEET at 25-75% concentration is the best repellent for the skin. Permethrin is the insecticide of choice for use on clothing, not skin. (Forgey, Travelers' Medical Resource, pp. 5-21-5-25)

When sleeping indoors in insect-infested areas, it is important to make certain that windows and doors have screens and that there are no other openings that would allow insects to enter. When sleeping outdoors or under open-air shelters, or indoors where mosquitoes can get inside, one must

sleep under mosquito netting. All openings have to be closed, tucked, etc. Insects come inside the netting while a traveler is attempting to crawl in. They also come in after having landed on the person. Mosquitoes have to killed that have gotten inside the netting.

Chemoprophylaxis should be used in any travel to mosquito-prone areas in the tropics. It takes only one bite from an infected mosquito to transmit malaria. Travel in mosquito- and other insect-prone areas can be quite tolerable if the proper precautions are taken.

D. Environmental Emergencies

There are many types of environmental emergencies which include the bites and stings of insects, reptiles, mammals, and marine life, plant reactions, toxic shellfish reactions, altitude illness, diving injuries, drownings, dehydration, hypothermia (cold injuries), hyperthermia (heat injuries).

In Tropical Latin America, any of these environmental emergencies can occur. The following information will focus on heat-related problems and dehydration due to the common occurrence of these problems at the lower elevations in the tropics.

The human body attempts to maintain a stable operating system known as homeostasis. This equilibrium can be upset by the environmental or toxic challenges mentioned above. Humans evolved in the tropics and are better suited for survival in tropical regions than in temperate , alpine, or polar regions.

Important environmental factors in maintaining homeostasis include insuring adequate oxygenation of the blood, maintaining an appropriate immune system response to antigens, maintaining adequate glucose levels and adequate electrolyte and acid/base balances, and maintaining adequate fluid levels.

The temperature extremes found on Earth range from -100 to130 degrees Fahrenheit. The body maintains an average core temperature of 98.6 degrees. The body can function generally from around 97-104 degrees but can also survive at core temperatures of 90-107 degrees.

The body's thermoregulatory system attempts to maintain a normal core body temperature by balancing heat production and heat conservation against heat loss.

Heat production is controlled by the basal metabolic rate which is affected by fluids and fuel (food stores) as well as voluntary exercise or the involuntary response of shivering.

Heat conservation is controlled by the shell/core compensation (increasing or decreasing blood flow to the vital organs or skin and extremities), piloerection (hair standing up), and the abolition of

sweating.

Heat loss factors include conduction (such as sitting on cool ground or immersion in cool water), convection (wind chill), evaporation (sweating), and radiation (heat moving away from the skin, especially the head).

A normal heat response involves sweating, red skin, normal shell/core compensation (blood vessels in the extremities and near the skin dilate) and a normal output of urine. In normal heat response, the fluid volume and electrolytes stay intact and the body is able to cool itself.

Heat challenges cause two major problems. The body can become dehydrated and suffer associated electrolyte imbalances, and the core body temperature can become elevated to dangerous levels.

Heat exhaustion, heat syncope (fainting), and heat cramps are caused by dehydration and electrolyte depletion. Heat exhaustion is defined as severe dehydration and may include fatigue, headache, nausea, vomiting, decreased urine output, anxiety/confusion/agitation, slightly increased pulse and respiration rates, as well as pale, cool, and clammy skin. Despite the potentially confused state, there will be a relatively normal level of consciousness (LOC).

The treatment of heat exhaustion, heat cramps, and heat syncope includes rest in a cool place and the replacement of fluids and electrolytes. These illnesses are typically associated with heat challenges; however, they can occur in cooler environmental conditions where there is the possibility of dehydration and electrolyte depletion. Patients that recover adequately do not need to be evacuated.

Heat stroke (hyperthermia) is the elevation of the core body temperature to a dangerous level. Heat stroke is a life-threatening emergency. Signs and symptoms of heat stroke include red, hot, dry or wet skin, and a body temperature of 105 degrees or higher. The major sign, however, is a decreased level of consciousness. The LOC decreases from confusion/disorientation to seizures, coma, and death.

The treatment of heat stroke is rapid cooling by using shade, splashing cool water on the victim, or using wet bandanas, t-shirts, etc., fanning the victim, and massaging the extremities. Fluids should be given only if the patient's LOC improves enough to take fluids without choking or vomiting. Heat stroke victims must be evacuated to definitive care.

Since heat stroke is a thermoregulatory problem, it is possible to go directly from a normal heat response to heat stroke. Given the devastating consequences of heat stroke, travelers must be alert to

the heat challenges and the body's response to these challenges.

Prevention of heat injuries includes monitoring activity levels, maintaining adequate hydration, and using appropriate protective clothing and shelter. Acclimatization to heat is important. Whenever going on a trip to a hot environment, it is good to reduce activity levels and increase fluids for a few days to allow the body to adjust to the change in environment.

E. Hygiene

Hygiene is hard to maintain, particularly on backcountry trips in the tropics. Staying relatively clean can help to reduce infections of bites, stings, and other open wounds. Potable water should be used for wound cleaning, hand washing, face washing, teeth brushing, food preparation, and drinking.

Hands should be washed as often as possible and especially after bathroom visits and direct or indirect contact with others.

Shoes and socks should be worn in all backcountry situations. Feet may stay wet all day but it is imperative to keep them clean and dry at night to avoid immersion foot and fungal infections.

Cotton underwear should be worn in tropical regions and appropriate defecation and human waste disposal procedures should be used to prevent urinary tract infections and water contamination.

Food handling, preparation, and clean-up procedures should follow appropriate standards of hygiene.

Swimming should be avoided unless water is expected to be free of pollution and infectious agents.

Invasive medical procedures should be postponed, unless they are absolutely necessary, until reaching high quality health care systems.

F. Post-trip Follow-up

Post trip follow-up is essential to discover and/or treat any illnesses or injuries which may have occurred during the trip. Medications such as Chloroquine or antibiotics must be continued upon the return home as the prescription indicates.

There are three basic levels of post-trip evaluation and treatment. The first is a self-evaluation and treatment. The second level involves a professional medical evaluation and treatment by a physician. The third level involves the evaluation and treatment by physicians who specialize in tropical diseases.

G. Leadership

Leadership is a vitally important issue on all trips, especially foreign trips. It takes considerably more skills and experience to lead trips in developing countries. There are many issues such as customs, language, transportation, laws/regulations, emergency/evacuation problems, disease, etc. that complicate the trip.

It is necessary for trip leaders to know when to contract more knowledgeable, skilled, and experienced people and organizations to help plan and implement trips.

Participants and /or expedition members and their leaders are going to likely behave much differently when faced with the stresses of a foreign trip. Expedition behavior can develop which can cause serious risk management problems as well as simply detract from the enjoyment and rewards of travel.

Leaders must be extremely focused on the group, especially given these additional challenges. Since they are also more likely to get sick on a foreign trip, good assistant leaders are essential.

Outdoor adventure travel in Latin America offers a tremendous opportunity to learn, recreate, and experience other people and places. The travel adventure can be considerably disrupted by many things. Proper planning, implementation, and post-trip follow-up can greatly increase the opportunity for fun, safe, and rewarding travel.

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VI. Appendix

- **A. Latin America**
- **B. Travel Medicine Terminology**
- **C. Endemic Diseases**
- **D. Water Disinfection**
- **E. Travelers Medical Kit**
- **F. Principles of Safe Foreign Travel**
- **G. Sources of Wilderness & Travel Medicine**

Appendix A

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Appendix B

Travel Medicine Terminology

From: **William W. Forgey, MD, Franklin Hubbell, DO, &**
The New Webster's Medical Dictionary

Antibiotic - A substance that inhibits the growth of microorganisms.

Antibody - A modified protein of an animal, usually formed in response to an infectious agent, such as a virus or bacterium, that causes a reaction in the host animal that destroys the infectious agent.

Antigen - Any of various types of substance (such as bacteria, virus, foreign protein) that causes an antibody to form, thus producing an immune response.

Antitoxin - An antibody that is formed to defend the host animal against a foreign (usually protein) substance, such as snake venom or other poisonous substance, that neutralizes or otherwise prevents the toxic substance from causing harm, used to achieve passive immunity or to effect a treatment.

Antivenin - The active substance in an antiserum that protects an animal against another animal's, or insect's, venom.

Bacteria - Plural form of bacterium.

Bacterium - Any one cell vegetable microorganism, some of which cause disease in man, animals, and larger plants. Contain organells for obtaining energy from their surroundings. Can replicate themselves by the process of binary fission or splitting.

CDC - Centers for Disease Control.

Encephalitis - An infection of a layer of tissue covering the brain, frequently resulting in death or severe neurological damage, generally caused by a viral or bacterial infection.

Endemic - The usual frequency of occurrence of a disease, including possible seasonal variations, in a human population. Less precisely, a disease prevailing continually in a region.

Envenomate - To inject venom into, as a result of a poisonous bite or sting.

Epidemic - The extensive prevalence in a community or region of a disease, including possible seasonal variations, in an animal population.

Epidemiology - The study of epidemics and epidemic diseases.

Prophylactic - Preventing disease; relating to prophylaxis.

Prophylaxis - The prevention of disease.

Protozoa - Usually unicellular, parasitize hosts via the oral route (in food and water), by being injected through skin by an insect, or by wórming their way through skin after direct contact.

Quarantine - The state or condition during which measures are applied by a health administration to a ship, an aircraft, a train, road vehicle, other means of transport or container, or individuals to prevent the spread of disease from the object of quarantine to reservoirs, vectors of disease, or other individuals.

Quarantinable Diseases - Cholera, plague, and yellow fever.

Recommended Vaccination - Vaccination not required by International Health Regulations but suggested for travelers visiting or living in certain countries.

Required Vaccination - Vaccination the traveler must have for entry into, or exit from, a country. The travelers must present a validated International Certificate of Vaccination which documents the vaccination(s) required.

Serology - A blood test for an antibody response, generally performed to check for syphilis exposure and presumptive infection; the branch of science dealing with serum, especially with specific immune serums.

Specific Immune Globulin - Special preparations obtained from donor pools preselected for a high antibody content against a specific disease.

Topical - Applied to the skin surface, as with an ointment.

Toxin - A noxious or poisonous substance.

Toxoid - A toxin that has been treated so as to destroy its toxic property, but which is still antigenic, i.e., capable of stimulating the production of antibodies and thus producing an active immunity.

Transmission - The transfer of disease from one individual to another; transfer of hereditary characteristics or traits.

U.S.P.H.S. - Initials of the United States Public Health Service.

Vaccine - The modified and attenuated virus (or bacterium) of any disease, incapable of producing severe infection, but affording protection, when inoculated, against the action of the unmodified virus (bacterium).

Vector - The term applied to an insect or any living carrier which transports a disease causing microorganism from the sick to the well.

Venom - A poisonous fluid secreted by snakes, spiders, scorpions, etc.

Virus - Smallest of all living creatures, consisting only of a genetic core of DNA or RNA and a protective viral coat or shell. In order for a virus to survive, thrive, and reproduce, it has to gain access into a host and then into a specific type of cell or tissue.

WHO - The initials of the World Health Organization

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Appendix C

Endemic Diseases

Endemic Diseases	Type	Transmission	Prophylaxis	Vaccine Recommendation:
Cholera	Bacterial	Food/Water	Vaccine (<50% effective ?)	Vaccine...high risk areas
Dengue Fever	Viral	Mosquitoes	Mosquito precautions	None
Diphtheria	Bacterial	Direct/Indirect Contact	Vaccine	Childhood Vaccine
Dysentery (Amoebic/Bacillary)	Protozoan, Bacterial	Food/Water	Food/Water Precautions	None
Giardiasis	Protozoan	Water	Water Precautions	None
Hepatitis A	Viral	Food/Water	Vaccine/Immune Globulin	Vaccine recommended for all travel
Hepatitis B	Viral	Blood/Body Fluids	Vaccine, Safe Sex, First Aid Personal Protective Equipment	Recommended for all travelers...will become a routine vaccination in US
Hepatitis C	Viral	Blood/Body Fluids	Safe Sex	None
Hepatitis D	Viral	Food/Water	Food/Water Precautions	None...Must have been previously infected with Hepatitis A
Hepatitis E	Viral	Food/Water	Food/Water Precautions	None
HIV	Viral	Blood/Body Fluids	Safe Sex, First Aid Personal Protective Equipment	None
Influenza	Viral	Direct/Indirect Contact	Vaccine/Hand Washing	Recommended for elderly, health care workers
Malaria	Protozoan	Mosquitoes	Chemoprophylaxis	Recommended for all tropical areas
Measles	Viral	Direct/Indirect Contact, Airborne	Vaccine	Childhood Vaccine
Meningitis (Meningoccocal)	Bacterial	Indirect/Direct Contact	Vaccine	Recommended or required for high risk areas

Mumps	Viral	Direct/Indirect Contact, Airborne	Vaccine	Childhood Vaccine
Plague	Bacterial	Fleas on rodents	Vaccine	Recommended for travel to infected areas
Pneumococcus	Bacterial	Direct/Indirect Contact	Vaccine/Hand Washing	Recommended for elderly, health care workers
Polio	Viral	Food/Water/Airborne	Vaccine	Recommended booster for travel to infected areas
Rabies	Viral	Blood/Saliva/Fecal	Vaccine/Avoid animals	Recommended for travelers at risk of significant exposure to animals
Rubella	Viral	Airborne	Vaccine	Childhood Vaccine
Shistosomiasis	Helminthic	Fresh Water Snails	Avoid swimming/bathing/ washing clothes in infected areas	None
Sexually Transmitted Diseases	Viral, Bacterial	Body Fluids	Safe Sex	None
Tapeworms	Helminthic	Undercooked Meat	Eat thoroughly cooked meat	None
Tetanus	Bacterial	Open wounds	Vaccine	Recommended for all travelers
Travelers Diarrhea	Bacterial, Viral, Protozoan, Toxins	Food/Water	Bismuth Subsalicylate(Pepto), Antibiotics	None
Trichinosis	Helminthic	Undercooked meat	Eat thoroughly cooked meat	None
Tuberculosis	Bacterial	Airborne	Vaccine	Recommended for health care workers in infected areas and travelers known to have been exposed to TB
Typhoid Fever	Bacterial	Food/Water	Vaccination	Recommended for required for high risk areas
Yellow Fever	Viral	Mosquitoes	Vaccination	Recommended or required for high risk areas

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Appendix D

WATER DISINFECTION

HEAT/BOILING

considerations: •rolling boil sufficient– safe to drink, kills all disease-causing life forms

advantages: •most reliable
•can see it working– no precision needed

disadvantages: •need to carry extra fuel and stove
•takes time and effort

HALOGENATION

considerations: •dosage & contact time
•reduce debris before adding chemicals– filter through bandana/coffee filter

iodine: •not recommended for those with thyroid disease or known allergy to iodine
•not as sensitive to pH, etc. as chlorine; less bothersome taste than chlorine

chlorine: •very sensitive to pH levels, organic matter, pollutants
generally unreliable for wilderness travel– chlorine compounds unstable

advantages: •system lightweight, easily available/prepackaged

disadvantages: •taste (any drink mixes used to improve taste should be used after treatment, as they may bind with halogen and interfere with disinfection) question of safety in long-term use several factors effect how long/how much halogen needed
•temperature/pH/organic matter sensitivity patience, not immediate– time spent waiting for effect; contact time longer in cold water must be conscientious to get threads around bottle
Cryptosporidium resistant to chemical disinfection

FILTRATION

considerations: some just bacteria, some include viruses, protozoa
KNOW WHAT YOU'RE BUYING!

advantages: convenience

disadvantages: •System may be heavy and expensive.
•It may not eliminate viruses; may need chemical treatment too.
•System may have undetected defects.

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Appendix E

PERSONAL FIRST AID KIT

2 Large cravats
2 Surgipads or Kotex
4 4" X 4" gauze pads
10 1" Bandaids
1 1" X 10 yd roll of adhesive tape
6 Safety pins
2 Rolls of 4" Kling
1 6" ACE bandage
6 Alcohol wipes or Betadine wipes
1 Tube of Povidone-iodine
Moleskin or Spenco Second Skin
Knife or scissors
Paper & pencil
1 SAM splint (optional)

All of this can be placed into a waterproof bag which fits in a stuff sack.
(Kit, not including SAM splint, weighs a little over a pound.)

PERSONAL BIVY KIT

2 Large garbage bags (shelter or emergency rain gear)
OR a 10' X 10' sheet of plastic + 100' of parachute cord
Emergency space blanket
Metal cup
Jell-O with sugar (NOT Nutrasweet)
Lighter or waterproof matches
2 Plumber's candles
Knife
Whistle (plastic in winter)
Compass
Flashlight (small enough to carry in your mouth)
Stocking cap
Spare pair of non-cotton socks (can double as mittens)

All of this fits into a small stuff sack and weighs about 20 ounces.
ALWAYS CARRY RAIN GEAR, both tops & bottoms, even on short day hikes.

PERSONAL DENTAL FIRST AID KIT

Topical anesthetic: Oil of Clove (eugenol) or Ambesol
Temporary filling material: Cavit, Zinc Oxide
Analgesics: Ibuprofin, Tylenol, Aspirin
Antibiotics: Pencillin, Keflex, Erythromycin (for penicillin-allergic patients)
Mouth mirror
Cotton balls
Gauze
Toothbrush
Dental Floss

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TRAVELER'S MEDICAL KIT & CONSIDERATIONS

Prescription Medications:

- Carry enough of your usual prescriptions meds for the trip.
- If you wear contacts, carry a set of glasses.

Means of Water Purification

- Carry water purification tablets, liquid, or filters.

Food:

- Don't eat food from street vendors, unless hot off the grill.
- Don't eat raw or undercooked veggies or fruit unless it can be peeled.
- Don't eat undercooked meat (BEEF, CHICKEN, POULTRY, IGUANA, PORK, ET AL)
- Wash your hands (don't self-contaminate).
- Beware of restaurant food and eat only food served hot: no ice, no water, no cream sauces.
- Drink only pasteurized sealed beverages (alcohol & freezing do not destroy bugs)

Feet:

- Always wear shoes ...

Sunburn:

- Prophylaxis: "sunblocks" & sun glasses
- Zinc oxide for 100% block or Photoplex-type sunscreen

Rx: 1. Cover up & use moisturizers
2. Tylenol or any NSAID for pain

Malaria: #1 disease worldwide:

- Current appropriate prophylaxis regime (chloroquine, mefloquine, or doxycycline)
- Active disease? Consult CDC or a specialist
- Prevention: mosquito netting & insect repellents (permithrin)

Analgesics:

- Minor pain control and headaches: Aspirin, Advil, Tylenol, 1 every 4 hours as needed
- Severe pain or migraine: Tylenol 3 or Darvocet, 1 every 4 hours as needed

Skin Infections: Cellulitis

- The affected area will be red, swollen, warm, tender; there may be purulent discharge.
- Infection is severe if there are red streaks, swollen lymph nodes, and fever.
- Treat early, don't wait for signs of serious infections.

Rx:

1. Warm, moist compresses TID - QID, made with sterile water; may use betadine/iodine
2. KEFLEX (cephalexin) 500mg po TID x 7 - 10 days
   BACTROBAN OINTMENT (mupirocin) -- for impetigo; apply to affected area BID

Eye Infections: Conjunctivitis of Corneal Abrasion

- Red conjunctiva with or without purulent discharge
- Pain secondary to corneal abrasion, always treat corneal abrasion prophylactically

Rx:

1. GARAMYCIN OPHTHALMIC OINTMENT (gentamycin) - 1/2 inch QID

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Sore Throat & Coughs - Respiratory Tract Infections:

- Severity of infection is indicated by fever & productive cough

Rx:

1. ERYTHROMYCIN 333 mg po TID X 10 days
2. or KEFLEX (cephalexin) 500mg po TID x 10 days.

Urinary Tract Infections:

- Pain/burning with urination; frequency, urgency of urination
- Severity indicated by fever/chills and back pain; may indicate a kidney infection

Rx:

1. Force clear fluids.
2. Use BACTRIM DS(trimethoprim/sulfamethoxazole) po BID X 10 days.
3. If allergic to "sulfa drugs," use KEFLEX (cephalexin) 500mg po TID x 7 days.

Vaginitis:

- Vaginal discharge, may be itchy.

Rx:

1. Good hygiene.
2. Over the counter treatment consists of vaginal suppositories: use 1 intravaginally at bedtime 3 concurrent days or may use a betadine douche (30 ml of 2% betadine in 500 ml of water).

Fungal Infections of Skin, Feet, Groin:

- Area of skin is red with an advancing border of redness, scaly skin, may be itchy.

Rx:

1. Keep area clean and dry.
2. NIZORAL CREAM (ketoconazole) or LAMISIL CREAM: apply to rash BID.

Contact Dermatitis (poison ivy, oak, sumac):

- Allergic reaction to resin on plant
- Red streaks on skin with small blisters, very itchy

Rx:

1. Wash area well with soap and water and wash any clothes that came into contact w/ the plant.
2. HYDROCORTISONE CREAM: apply to affected area BID.
3. BENADRYL (diphenhydramine): 25mg every 6 hours.
4. If severe and spreading, may require PREDNISONE 30-50mg daily for 7 days.

Diarrhea:

Rx:

1. HYDRATION & oral rehydration salts/solutions (Gatorade)
2. PEPTOBISMOL (bismuth subsalicylate) or IMMODIUM (lopermide) 1 tab every 4 hours
3. If no improvement in 24 hours then use BACTRIM DS po BID x 7 days or CIPRO 500mg po BID x 7 days or FLOXIN 400mg po BID x 7 days; may use FUROXONE in children 5mg/kg in 4 equally divided doses.

Nausea/vomiting:

Rx:

1. PHENERGAN (promethazine) 25mg 1 tab every 4 hours
2. As nausea abates, rehydrate with dilute electrolyte solution.

General GI Upset/heartburn:

- Mylanta, Maalox, Tums as needed

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Insect Bites & Stings:

- Use insect repellents - DEET-containing or permethrin clothing aerosols

Minor Allergic Reactions:

- Rhinitis/runny nose, itchy eyes, congestion

Rx:

1. BENADRYL (diphenhydramine): 25mg 1 capsule every 4-6 hours.

Acute Anaphylactic Reactions:

- Hives, INCREASING DIFFICULTY BREATHING

Rx:

1. EPINEPHRINE (adrenalin) 1:1000 "BEE STING KIT."
   0.3cc injection in the deltoid muscle; repeat in 20 - 30 minutes if necessary
2. Antihistamine tablets: chlorpheniramine tablets from the kit as soon as they can swallow.

Headaches, generalized aches & pains and fever:

Rx:

1. TYLENOL (acetominophen): 1- 2 tabs every 4 hours as needed.
2. MOTRIN (ibuprofen): 1- 2 tabs every 6 hours with food.

Constipation:

Rx:

1. Increase fluids & fiber
2. MILK OF MAGNESIA 5ml every 6 hours
3. If no results with MOM, use DUCOLAX SUPPOSITORY X 1

CONTENTS OF THE TRAVELER'S MEDICAL KIT (Expedition Team Kit)

PRESCRIPTION MEDICATIONS & non-prescription medications:
KEFLEX (Cephalexin) 500mg tablets #30
ERYTHROMYCIN 333 mg tablets #30
BACTRIM DS (Trimethoprim/sulfamethoxazole) tablets #2.
FLOXIN 400mg or CIPRO 500mg tablets #20
BACTROBAN OINTMENT 1 15gram tube
GARAMYCIN OPHTHALMIC OINTMENT 1 tube
NIZORAL CREAM OR LAMISIL CREAM 1 15 gram tube
Hydrocortizone cream 1 tube or ULTRAVATE STEROID CREAM 1 15 gram tube
PREDNISONE 10mg tablets #40
Benadryl 25mg #50
Peptobismol tablets and/or Immodium tablets #50
PHENERGAN 25 mg tablets #20
ANAKIT #2
Ibuprofen #50
TYLENOL 3 #30
Tylenol #50
Ducolax tablets #20
Sunblock - Zinc Oxide = 100% block
Blister kit: mole skin/foam or second skin

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Appendix F

Principles of Safe Foreign Travel

- Obtain skills & knowledge in Wilderness & Travel Medicine
- Know your trip leadership capabilities...hire reputable guide services and/or travel with knowledgeable/skilled/experienced group members
- Check US State Department Travel Advisory...Heed Warnings!
- Check CDC & travel medicine publications/books
- Obtain Recommended/Required Vaccinations/Medication Prophylaxis... Be current on the standard childhood vaccinations
- Take an appropriate medical kit...know how to use it
- Have an Emergency Plan
- Use DEET, Permethrin, mosquito netting, and appropriate clothing to avoid mosquito bites & other insect bites
- Be attentive to potential criminal and terrorist activities
- Always wear shoes
- Avoid swimming in suspect water
- Check often for ticks
- Never approach or attempt to handle/pet any animals
- Suspect all water & ice...Drink bottled water/drinks & hot drinks
- "Cook it, boil it, peel it, or forget it!"...Use appropriate food & water precautions...Avoid salads, fruit that cannot be peeled, undercooked meat, raw fish, rewarmed food, or food that normally requires refrigeration. Eat freshly prepared hot food and fruits that you peel (with clean hands).
- Don't share water bottles, utensils, half-eaten food, etc.
- Don't allow sick people to prepare food
- Practice Safe Sex
- Use Personal Protective Equipment when administering first aid & health care
- Wash your hands often...with potable water!
- Follow-up with post-trip medical examinations for potential trip-related chronic or unexplained medical problems
- Monitor yourself and your group for acclimatization problems, medical problems, psychological problems, etc and help make sure everyone has the opportunity to have fun!

Appendix G

Sources: Wilderness/Travel Medicine & Travel Safety

Adventure Travel Business Trade Association, 6551 South Revere Parkway, Suite 160, Englewood, CO 80111 (303) 662-8282

American Society of Tropical Medicine and Hygiene, 64343 First St. N.W., Washington, DC 20015 (202) 364-5969

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International Society of Travel Medicine, P.O. Box 15060, Atlanta, GA 30333-0060

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US Department of State, Overseas Citizens Bureau, Bureau of Consular Affairs, Washington, DC 20420 (202) 634-3600, Citizen's Emergency Center: (202) 647-5225